इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 9748 (1981): Metallic Slide Fasteners (For Aviation Purposes) [PGD 14: Consumer Products and Allied Equipments]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN
IGNORANTIA JURIS NON EXCUSAT
PROTECTED BY COPYRIGHT

“पुनर्पुष्ट १९९६”
“RE-AFFIRMED 1996”

IS : 9748 - 1981

(Reaffirmed 2001)

Indian Standard

SPECIFICATION FOR METALLIC SLIDE FASTENERS (FOR AVIATION PURPOSES)

UDC 672·837 : [669 : 629·13]

© *Copyright* 1981

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

~~Price Rs 10·00~~ Gr. 6

June 1981

Indian Standard

SPECIFICATION FOR METALLIC SLIDE FASTENERS (FOR AVIATION PURPOSES)

Fasteners for Consumer Goods Sectional Committee, CPDC 22

Chairman	*Representing*
Shri S. Majumdar	Directorate General of Technical Development, New Delhi
Members	
Shri B. S. Bhatnagar	Bengal Waterproof Works (1940) Ltd, Calcutta
Shri B. Dutt (*Alternate*)	
Shri T. A. Devagnanam	Needle Industries (India) Ltd, Ketty P.O. (Nilgiris)
Shri G. V. Mohan Rangaraj (*Alternate*)	
Shri Ranjit H. Malkani	Fleet Fasteners Pvt Ltd, Bombay
Shri N. S. Peswani (*Alternate*)	
Shri M. T. Mathai	A. T. Industries, Delhi
Shri B. K. Mehan	Federation of Association of Small Scale Industries of India, New Delhi
Shri B. S. Narayana Rao	Bangalore Dress Manufacturing Co Pvt Ltd, Bangalore
Shri K. N. Ranga Rao (*Alternate*)	
Shri S. T. Notani	Associated Apparel Pvt Ltd, Bombay
Shri B. V. Patel	Velcro India Ltd, Bombay
Wg Cdr K. Rajan	Aero-Bio Engineering Unit, Bangalore
Shri Swadesh Kumar Sett (*Alternate*)	
Shri M. R. Samtani	M. S. Patel & Co, Bombay
Shri R. K. Samtani (*Alternate*)	
Shri T. R. Sehgal	Development Commissioner Small Scale Industries, New Delhi
Shri P. K. Shroff	Nylo Plast Industries (P) Ltd, Bombay
Shri H. J. Thacker (*Alternate*)	
Shri D. N. Sinha	Tannery & Footwear Corporation of India Ltd, Kanpur
Shri N. R. Bose (*Alternate*)	

(*Continued on page* 2)

© *Copyright* 1981
INDIAN STANDARDS INSTITUTION
This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

Members	*Representing*
SHRI G. P. SINHA	Additional Director General of Ordnance Factory, Kanpur
MAJ S. K. VERMA	Ministry of Defence (DGI)
SHRI K. R. GARG (*Alternate*)	
SHRI SOM PRAKASHA, Director (Consr Prods & Med Instrs)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI B. K. MAHATA
Deputy Director (Consr Prods & Med Instrs), ISI

Slide Fasteners Subcommittee, CPDC 22 : 1

Convener	
MAJ P. N. MALHOTRA	Ministry of Defence (DGI)
Members	
SHRI K. K. KAPUR (*Alternate* to Maj P. N. Malhotra)	
SHRI B. S. BHATNAGAR	Bengal Waterproof Works (1940) Ltd, Calcutta
SHRI B. DUTTA (*Alternate*)	
SHRI J. K. JHAVER	Zip Industries Pvt Ltd, Madras
SHRI A. C. BHASKARAN (*Alternate*)	
SHRI B. S. NARAYANA RAO	Bangalore Dress Manufacturing Co Pvt Ltd, Bangalore
SHRI S. T. NOTANI	Associated Apparel Pvt Ltd, Bombay
SHRI N. S. PESWANI	Fleet Fasteners Pvt Ltd, Bombay
SHRI M. K. SANGHAVI	Madhu Fasteners Co, Bombay
SHRI SWADESH KUMAR SETT	Aero-Bio Engineering Unit, New Delhi
SHRI V. P. CHIRAYATH (*Alternate*)	

Indian Standard

SPECIFICATION FOR METALLIC SLIDE FASTENERS (FOR AVIATION PURPOSES)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 12 February 1981, after the draft finalized by the Fasteners for Consumer Goods Sectional Committee had been approved by the Consumer Products and Medical Instruments Division Council.

0.2 The requirements for general purpose metallic slide fasteners have been covered in IS : 3148-1978*. This standard has been formulated keeping in view the recent development in the use of metallic slide fasteners for aviation purposes.

0.3 In the preparation of this standard, assistance has been derived from F 121-1964 — Metallic Slide Fasteners for Aeronautical Purposes, issued by British Standards Institution.

0.4 This standard contains clauses which call for agreement between the purchaser and the supplier and which permit the purchaser to use his option for selection to suit his requirements. The relevant clauses are **3.1.1.2**, **4.1**, **5.1**, **8.1** and **9.1**.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the material, type and size, designations, tests and performance requirements for metallic slide fasteners (for aviation purposes).

---

*Metallic slide fasteners, general purposes (*second revision*).

†Rules for rounding off numerical values (*revised*).

2. NOMENCLATURE

2.1 For the purpose of this standard, the nomenclature for various parts as indicated in Fig. 1 shall apply.

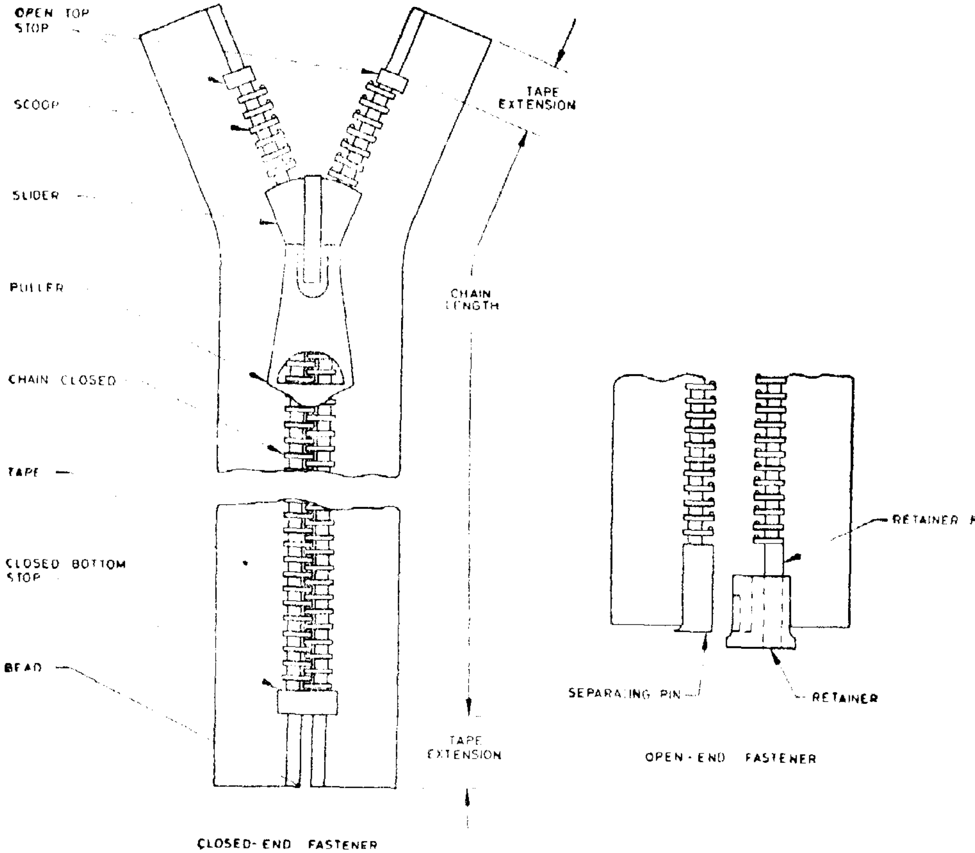


FIG. 1 NOMENCLATURE OF SLIDE FASTENER

3. MATERIAL

3.1 Metallic slide fasteners shall be manufactured from the following materials.

3.1.1 *Tape* — The tape shall be a woven fabric of cotton, nylon or polyethylene terephthalate, or a combination of these materials, and shall have a selvedge on each edge. A bead or cord of textile material shall be attached along one edge of the tape to facilitate the attachment of the scoop and shall be either woven integrally or securely sewn. For specified length fasteners, the tape shall be continuous and without splices along the full length of the fastener including tape extensions. The tape shall also withstand the requirements given in **3.1.1.1** to **3.1.1.4.**

3.1.1.1 *Moistureproofness and Rotproofness* — The tape shall be treated with a suitable moistureproofing material, with zinc naphthenate as rot-resistant:

a) *Moistureproofness* — When tested by immersion absorption method described in Appendix A, the tape shall not show absorption of more than 40 percent of water.

b) *Rotproofness* — The tape shall contain not less than 0·8 percent and not more than 1·2 percent of zinc when tested by the method described in **12** of IS : 3522 (Part I)-1966*.

3.1.1.2 Unless otherwise agreed to between the purchaser and the supplier, the width of tape shall be:

Designation	*Width of tape*
Medium Regular Medium Special	16 mm
Large Regular Large Special	20 mm

3.1.1.3 The tape and bead shall be uniformly dyed to the same shade of colour as specified.

3.1.1.4 *Colour Fastness*

a) *Fastness to light* — The tape and sewing cotton thread shall be fast to light and, when tested by the method prescribed in **A-5** of IS : 1895-1970† its colour fastness to light shall be of rating 5 or better.

b) *Fastness to perspiration* — The tape and sewing thread shall be fast to perspiration and, when tested by the method prescribed in IS : 971-1956‡, its colour fastness to perspiration shall be of rating 4 or better.

---

*Method for estimation of common preservatives used in textile industry, Part I.

†Specification for cotton tape *NEWAR*, grey or dyed (*first revision*).

‡Method for determination of colour fastness of textile materials to perspiration.

c) *Fastness to sea water* — The tape and sewing thread shall be fast to sea water and, when tested by the method prescribed in IS : 690-1956*, its colour fastness to sea water shall be of rating 4 or better.

d) *Fastness to washing* — The tape and sewing thread shall be fast to washing and, when tested by the method prescribed in IS : 765-1979†, its colour fastness to washing shall be of rating 4 or better.

e) *Fastness to organic solvents (dry cleaning)* — The tape and sewing thread shall be fast to dry cleaning and, when tested by the method prescribed in IS : 688-1956‡, its colour fastness to dry cleaning shall be of rating 4 or better.

3.1.2 *Chains* — Slide fastener chains shall be fabricated from brass, nickel, silver, zinc alloy or aluminium alloy.

3.1.3 *Components* — Components used in the fasteners shall be fabricated from brass, nickel, silver or aluminium alloys. Slider and puller shall be fabricated from brass, nickel, silver or zinc alloy.

4. DESIGNATION AND SIZES

4.1 Slide fasteners shall be designated by type, that is, close-end or open-end, and by the terms given in Table 1 according to the width across meshed chain. The length of the fastener shall be as required by the purchaser. The first 300 mm or part thereof and each subsequent 300 mm or part thereof shall be subject to a tolerance of + 5 mm.

4.1.1 The length of the fastener shall be taken as the total length of the metallic components of the fastener (excluding the tape and the puller) when completely closed and lying flat without tension.

4.1.2 Slide fasteners may be provided with locking arrangement.

TABLE 1 DESIGNATIONS AND SIZES OF METALLIC SLIDE FASTENERS

DESIGNATION	WIDTH ACROSS METHED CHAIN
Medium Regular	Over 4·5 mm but not more than 6·5 mm
Medium Special	
Large Regular	Over 6·5 mm but not more than 9·0 mm
Large Special	

---

*Method for determination of colour fastness of textile materials to sea water.

†Method for determination of colour fastness of textile materials to washing: Test 4 (*second revision*).

‡Method for determination of colour fastness of textile materials to organic solvents.

5. PROTECTIVE AND DECORATIVE FINISHES

5.1 The purchaser shall advice the manufacturer and enter into an agreement regarding any protective finish to be applied for fasteners which are to be exposed to corrosive influences, such as sea water, strong acids and akalis. If special decorative finishes are required, they shall be subject to negotiations between the purchaser and the manufacturer. In addition, owing to many different applications of the various types of fasteners and widely differing colour fastness characteristics required, any special colour fastness of tape or metal components shall be negotiated between the purchaser and the manufacturer.

6. PERFORMANCE REQUIREMENTS

6.1 The test specimen shall be brought to standard atmospheric conditions in accordance with the requirements of IS: 196-1966*. The fasteners shall comply with the requirements stated below:

a) Security of attachment of the puller to the slider (all types),

b) Security of attachment of top step (all types),

c) Security of attachment of bottom-stop for closed-end fastener,

d) Security of attachment of the retainer fitted to open-end fastener (longitudinal load),

e) Reciprocating movement of the slider under load (all types),

f) Breaking strength cross-wise of chains (all types),

g) Resistance of retainer to lateral load (open-end fastener), and

h) Resistance to deformation of mouth of slider.

6.1.1 *Security of Attachment of Puller* — The functioning of the slider shall be unimpaired after being subjected to the loading given below, in the manner described in Appendix B:

Designation	*Loading* *N*
Medium Regular	300
Medium Special	340
Large Regular	420
Large Special	580

---

*Atmospheric conditions for testing (*revised*).

6.1.2 *Security of Attachment of Top and Bottom Stops* — The functioning of the fastener shall be unimpaired after being subjected to the loadings given below, in the manner described in Appendix C:

Designation	*Top Stop Loading (All Types)* *N*	*Bottom Stop Loading (Closed-end Fastener)* *N*
Medium Regular	120	160
Medium Special	140	200
Large Regular	160	220
Large Special	200	240

6.1.3 *Security of Attachment of Retainer Fitted to Open-End Fasteners (Longitudinal Load)* — The fastener shall be subjected to the loadings specified below, in the manner described in Appendix D after which they shall be unimpaired and the two halves shall be capable of being readily and successively separated and re-assembled in accordance with the manufacturer's instructions:

Designation	*Loading* *N*
Medium Regular	150
Medium Special	250
Large Regular	350
Large Special	650

6.1.4 *Reciprocating Movement of Slider* — The functioning of the fasteners of all designations shall be unimpaired after completing 500 test cycles as described in Appendix E.

6.1.5 *Breaking Strength Cross-wise of Chains* — Neither the chain nor the tape shall break when subjected to the loading specified below, in the manner described in Appendix F:

Designation	*Loading* *N*
Medium Regular	450
Medium Special	550
Large Regular	650
Large Special	1 000

6.1.6 *Resistance of Retainer to Lateral Load (Open-End Fastener)* — The fasteners shall be subjected to the loading specified below, in the manner described in Appendix G after which they shall be unimpaired and the two halves shall be capable of being readily and successively separated and reassembled in accordance with the manufacturer's instructions:

Designation	*Loading* *N*
Medium Regular	150
Medium Special	200
Large Regular	250
Large Special	350

6.1.7 *Resistance to Deformation of Mouth of Slider* — The mouth of the slider shall be subjected to the loadings specified below, in the manner described in Appendix H. After completion of the test, the mouth of the slider shall not be deformed:

Designation	*Loading* *N*
Medium Regular	300
Medium Special	350
Large Regular	450
Large Special	650

7. MARKING

7.1 The individual fastener or the package, or both, shall be legibly and indelibly marked with the following:

a) Manufacturer's name, initials or trade-mark; and
b) Designation.

7.1.1 The fasteners may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

8. SAMPLING

8.1 Sampling and acceptance criteria for metallic slide fasteners shall be as agreed to between the purchaser and the supplier. A recommended scheme for the same is given in Appendix J.

9. PACKING

9.1 Fasteners shall be packed according to the instructions of the purchaser. But each packet of the fastener shall be provided with fitting instructions and an indication of typical applications for which it is suitable.

APPENDIX A

[*Clause* 3.1.1.1 (a)]

IMMERSION ABSORPTION METHOD FOR MOISTUREPROOFNESS TEST ON TAPE

A-1. APPARATUS

A-1.1 The apparatus used is shown in Fig. 2.

A-1.1.1 *Water Tank (Non-corrosive)* — Approximately 400 × 200 × 200 mm or of other suitable size.

A-1.1.2 *Steel Roller* — 750 ± 5 mm diameter and of suitable length to weigh 18 kg ± 100 g.

A-1.1.3 *Vulcanized Rubber Pad* — 300 × 300 × 15 mm with a hardness of 70 to 80 IRHD.

A-1.1.4 *Blotting Paper* — 0·20 to 0·25 mm thick and weighing 120 to 150 g/m^2. It shall be capable of absorbing 0·3 ml of water in 30 seconds. (This shall be tested by placing a 1 000 mm^2 piece of blotting paper over a wire mesh, having approximately 2 meshes per centimetre, slightly dished, and releasing 0·3 ml of water from a suitable pipette within 2 seconds, the tip of the pipette remaining in contact with the paper during the release of water. The time of absorption shall be measured from the start of the flow till absorption of water is complete as indicated by no further distinct reflection of light from the paper when viewed at an angle.)

A-1.1.5 *Suitable Metallic Sinker (Rod)* — Approximately 10 mm in diameter and 350 mm long with wire hooks.

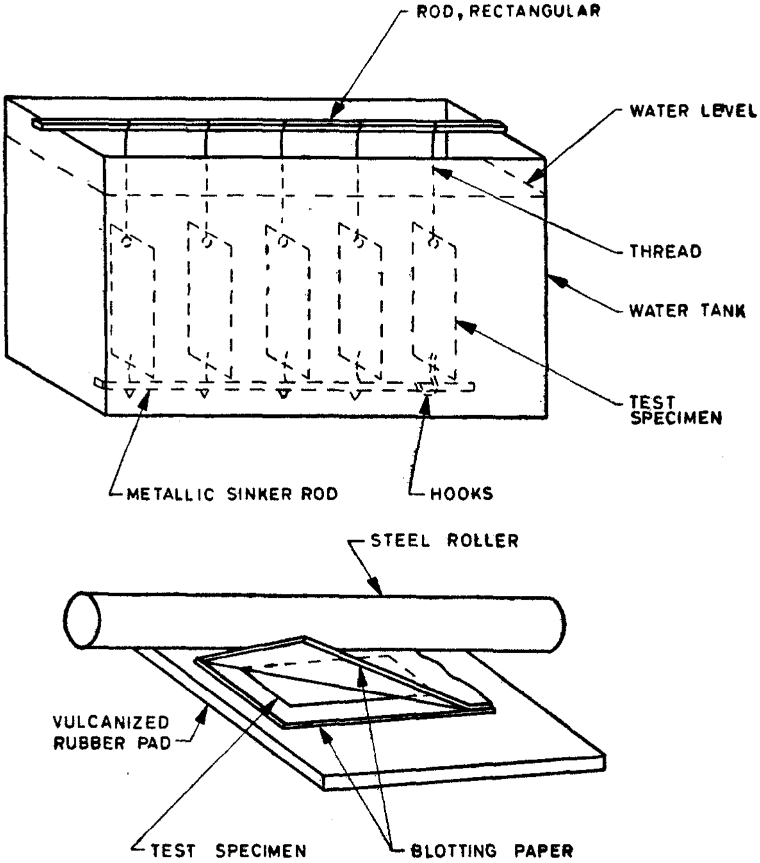


FIG. 2 APPARATUS FOR IMMERSION ABSORPTION TEST

A-2. TEST SPECIMEN

A-2.1 Dimensions

A-2.1.1 *Length* — 100 mm in all cases.

A-2.1.2 *Width* — Full width for tapes up to 62·5 mm wide. For tapes beyond 62·5 mm wide, the test specimen is cut to a width of approximately 60 mm and the edges frayed to give a width of 50 mm.

A-3. METHOD OF TEST

A-3.1 Five test specimens shall be prepared from the sample conditioned in an atmosphere of 65 to 70 percent RH and 27 ± 2° C temperature for a period of 24 hours and weighed together to the nearest 10 mg (M_1).

Wire hook shall be attached at one end of each specimen and a thread (about 150 mm long) near the other. The specimens shall then be immersed in distilled water contained in the tank for 30 minutes at 20 ± 2°C after attaching the metal sinker to the hooks so that the specimens remain immersed in water in a vertical position. The threads attached at the top end of the specimens shall then be passed over a suitable rod placed over the tank in order to keep the specimens steady in a vertical position during the immersion period. The water in the tank shall be sufficient to keep the top edges of the specimens about 50 mm below the water level.

At the end of the immersion period, all the five specimens shall be removed from water and, after detaching the hooks and the threads, placed one over the other, edge to edge. Each side of the five specimens shall then be held in contact with the bottom surface of a tray (which may be slightly inclined) for 5 to 10 seconds, in order to allow the water to drain out after which they shall be laid flat. Thereafter, one test specimen shall be taken and enclosed between two layers of the blotting paper on each side. The size of the blotting paper pieces shall be such that they extend about 20 mm beyond each edge of the test specimen. The specimen shall be placed on the rubber pad and roller, with its length parallel to the long side of the specimen, passed over it once at an approximate rate of 10 mm/s without exerting any additional pressure beyond that of the weight of the roller. The test piece shall then be removed from the blotting papers, enclosed in a fresh set of blotting papers as before and rolled once again in a similar manner. Thereafter, the test piece shall be placed in a spoutless beaker which shall be covered with lid.

The above process shall be repeated on all the remaining test specimens in quick succession. (It shall be permissible to take two or more test specimens at a time for rolling, if convenient, provided that they are placed side by side centrally and parallel to each other and that the distance between the adjacent specimens is not less than 40 mm).

The test specimens shall then be removed from the beaker and weighed collectively as quickly as possible to the nearest 10 mg and the mass noted (M_2). The difference between this weight and the original mass (M_1) before immersion shall be taken as the amount of water absorbed by the specimens and expressed as a percentage of the original mass:

$$\text{Percentage absorption} = \frac{M_2 - M_1}{M_1} \times 100$$

where

M_1 = mass in g of the samples taken for the test, and
M_2 = mass in g of the samples after immersion.

APPENDIX B

(*Clause* 6.1.1)

METHOD OF TESTING SECURITY OF ATTACHMENT OF THE PULLER

B-1. OUTLINE

B-1.1 The puller is subjected to tension while the slider is rigidly supported.

B-2. APPARATUS

B-2.1 The testing machine is of the constant-rate-of-traverse type and the speed of the opening of the jaws is 102 ± 13 mm per minute. The load range is such that the breaking load of the test specimen falls between 15 and 85 percent of the maximum on the scale.

NOTE — It is recommended that the load scale be calibrated at least once every 12 months; using dead weights added successively. Since calibration of these machines is normally carried out with maximum reading device in operative, the use of a maximum reading device at low loads may introduce serious errors.

B-2.2 A masking device for the slider, such as a face-plate or blanking-off plate, is required so that tension is confined to the puller and its attachment to the slider (*see* Fig. 3).

B-3. PROCEDURE

B-3.1 The specimen is mounted in one gripping device of the testing machine with the puller passed through a hole in the mask. The mask is so arranged that the slider and the chain are rigidly clamped in place, only the puller being free. The end of the puller is then secured to the other gripping device so that tension is applied at 90° to the face of the slider. The testing machine is then set in operation until the specified loading is reached, unless the specimen fails earlier.

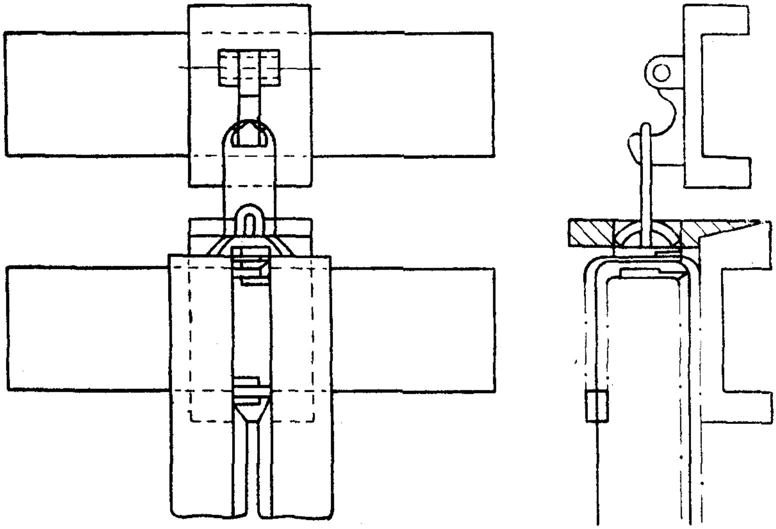


FIG. 3 ARRANGEMENT FOR PULLER ATTACHMENT TEST

APPENDIX C

(*Clause* 6.1.2)

METHOD OF TESTING TOP AND BOTTOM STOPS

C-1. OUTLINE

C-1.1 Each stop is subjected to tension while the fastener is secured in position, load being applied through the medium of the puller in such a way as to bring the stop under pressure from the slider.

C-2. APPARATUS

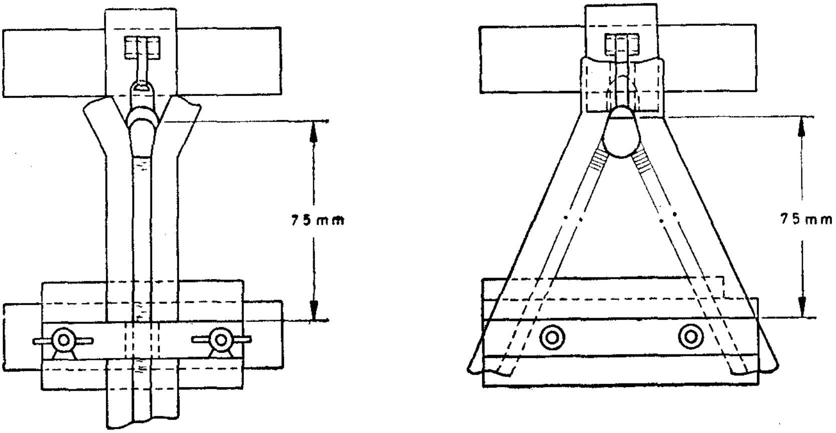
C-2.1 A testing machine as described in Appendix B is used. A schematic arrangement is given in Fig. 4.

C-3. PROCEDURE

C-3.1 Top Stop Test (All Types of Fasteners) — The test specimen is in the closed position with the slider adjacent to the top stop. The puller is secured in one jaw of the machine and the other end of the specimen in the other jaw, steps being taken to avoid damaging the chain.

The machine is then set in operation until the specified loading is reached, unless the specimen fails earlier.

C-3.2 Bottom Stop Test (Closed-End Fastener) — The test specimen is in the open position, the slider being adjacent to the bottom stop. The angle between the stringers* is the natural angle of opening, which is usually between 40° and 60°. The remainder of the procedure follows as described in **C-3.1**.



TOP STOP BOTTOM STOP

FIG. 4 ARRANGEMENT FOR TOP AND BOTTOM STOPS ATTACHMENT TEST

APPENDIX D

(*Clause* 6.1.3)

METHOD OF TESTING SECURITY OF ATTACHMENT OF RETAINER FITTED TO OPEN-END FASTENER

D-1. OUTLINE

D-1.1 The retainer is subjected to longitudinal load while the fastener chain is in the closed position.

D-2. APPARATUS

D-2.1 A testing machine as described in Appendix B is used. A schematic arrangement is given in Fig. 5.

---

*A row of scoops fitted on a textile tape.

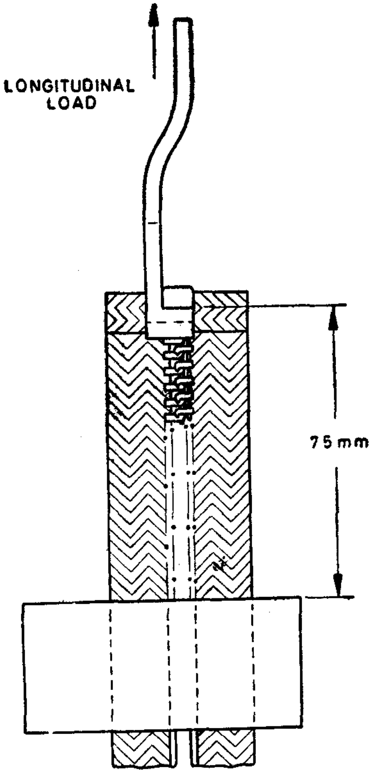


FIG. 5 ARRANGEMENT FOR SECURITY OF ATTACHMENT TEST FOR RETAINER FITTED TO OPEN-END FASTENER

D-3. PROCEDURE

D-3.1 With the test specimen in the closed position, the interlocked chain is clamped into one jaw of the testing machine, steps being taken to avoid damaging the chain. A slotted plate, shaped to clear the tape, chain and pin and to bear against the whole of the top edges of the retainer is clamped into the other jaw. The machine is set in operation until the specified loading is reached, unless the specimen fails earlier.

APPENDIX E

(*Clause* 6.1.4)

METHOD OF TESTING RECIPROCATING MOVEMENT OF SLIDER

E-1. OUTLINE

E-1.1 The test specimen is subjected to a specified number of cyclic operations while under lateral and longitudinal tensions.

E-2. APPARATUS

E-2.1 The testing machine, which operates in the vertical plane, is constructed on the lines shown in Fig. 6 and is such as to provide the following facilities:

a) Means of holding the specimen firmly at the bottom end with the fastener in the closed position, steps being taken to avoid damaging the chain.

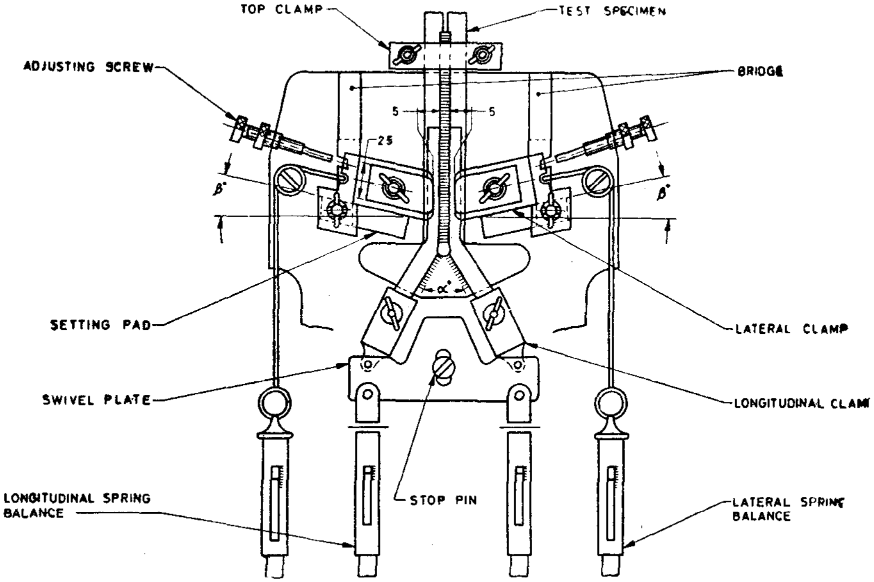
b) Means of separately gripping the two stringers at the other end so that the fastener beyond the slider is open. These gripping devices form the means of applying longitudinal spring balance loads to the fastener and thus require connecting together by a swivel-plate or other similar device, so that the fastener may be centralized when the loads are applied. It is also necessary for the gripping devices to swivel at the points of connection to the swivel-plate to facilitate the operation of the slider on the test specimen. The distance between the gripping devices is such that, when the slider is at the lowest point in the cycle, the two ends of the fastener subtend an angle of approximately 60° (*see* Fig. 6).

c) Means of gripping the tapes securely midway along the traversed length at opposite points of the testing zone so that the clamps may be subjected to load by means of spring balances. The clamps are so mounted that they are 'floating', that is, free to follow the natural direction of the opening of the fastener under test.

The clamps are capable of moving 5 mm in the direction of the pulleys, and setting pads are provided to hold the clamps in position until they are secured to the tapes (*see* Fig. 6).

The spring balances are of the tubular type and are of 9 kg capacity for the lateral tensions and of 4·5 kg capacity for the longitudinal load. In each case, a scale of 35 mm represents a 4·5 kg range.

The overall length of the balance, when closed at zero reading, does not exceed 165 mm, excluding the holding ring and the hook. The extended length does not exceed 229 mm at full load extension, excluding the holding ring and the hook. The weight corresponding to the interval between consecutive graduations does not exceed 0·1 kg. These graduations, which are permanent and legible, are not less than 0·8 mm apart. The error permitted on verification does not exceed the weight corresponding to half the interval between consecutive graduations, that is, not more than 0·06 kg.



All dimensions in millimetres.

FIG. 6 RECIPROCATION TESTER

d) Means of applying a regular harmonic reciprocating action through the medium of the puller, to the slider on the test specimen. The clamp or other gripping device is made in two parts fitting together by such means as V-grooves and springs. One part of the clamp is attached to the puller and the other to the reciprocating device, so as to facilitate indirect form of connection.

E-3. PROCEDURE

E-3.1 The test specimen is mounted in the vertical plane so that the bottom stop is upwards. The stringers are left separate at the other end so that they may be individually mounted in the machine. The lateral and longitudinal loadings are as follows:

Designation	*Lateral Load on Each Stringer* *N*	*Longitudinal Load on Each Stringer* *N*
Medium Regular	25	18
Medium Special	30	23
Large Regular	30	23
Large Special	40	30

The machine (*see* Fig. 6) is so arranged that the length of traverse of the slider is from 76 to 89 mm in each direction, a to-and-fro movement of 152 to 178 mm forming a cycle. The detailed procedure thereafter is as under:

a) Operate the machine by hand until the slider griper is in the lowest position, and place in position the setting pads.

b) Insert the slider puller between the slider gripper plates, ensuring that any locking device is withdrawn, and engage V-grooves of attachment.

c) Place the fastener loosely in position in the top tape clamp.

d) Secure the fastener ends in the bottom tape clamps.

e) i) Take hold of the fastener at its top end and draw upwards until stop pin prevents any further upward movement, without stretching the tape. Tighten the top clamp.

ii) If, while carrying out step (e) (i), the fastener is completely closed, then the tape ends that are attached by the bottom tape clamps are too long. To overcome this, release longitudinal, lateral and top clamps and cut off a length of each bottom tape end. To reassemble start at (c).

f) Apply the appropriate longitudinal loads by adjusting the spring balances.

g) Secure lateral clamps to the fastener tapes. There should be gaps of 5 mm between the lateral clamps and the chain at the nearest points. Ensure that the centre line of the clamps coincide with the strings which pass over the pulleys. Also ensure that the lateral clamps are held firmly against the setting pads whilst securing clamps to the fastener tape. Withdraw the setting pads after fixing the clamps.

h) Apply the appropriate lateral loads by adjusting lateral spring balances.

j) Set counter to zero. Put the machine in motion for one cycle only to equalize the position of the fastener.

k) Check the loadings of lateral and longitudinal spring balances and adjust when necessary. When the slider is in the lowest position set the adjusting screw 5 mm away from the lateral clamps.

m) Set the machine in motion at a constant speed. The slider should make 30 cycles per minute.

n) Once the test has started, do not readjust the longitudinal lateral spring balances.

p) Leave the machine in operation until the specified number of cycles is completed, unless the specimen fails earlier.

APPENDIX F

(*Clause* 6.1.5)

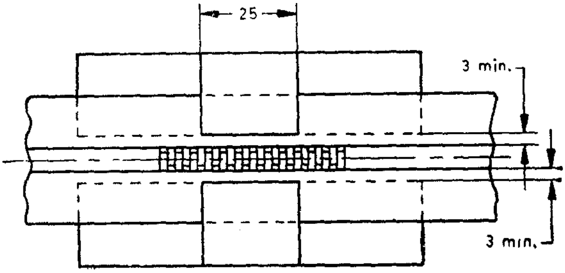
METHOD OF TESTING RESISTANCE OF CHAIN TO LATERAL LOAD AND BREAKING STRENGTH CROSSWISE OF CHAINS

F-1. OUTLINE

F-1.1 The test specimen is subjected to lateral load under controlled conditions while the fastener chain is in the closed position.

F-2. APPARATUS

F-2.1 A testing machine as described in Appendix B is used. The gripping jaws or other securing devices have a gripping surface 25 mm wide. The jaws shall be so constructed and finished as not to damage the tape and not to allow the specimen under test to slip (*see* Fig. 7).



All dimensions in millimetres.

FIG. 7 LATERAL LOAD TEST FOR CHAINS OF ALL TYPES

F-3. PROCEDURE

F-3.1 The test specimen is secured in place with the gripping devices so arranged that at least half the width of each tape is gripped and there is at least 25 mm of closed chain on either side. The machine is then set in operation until the specified loading is reached, unless the specimen fails earlier.

APPENDIX G

(*Clause* 6.1.6)

METHODS OF TESTING RESISTANCE OF RETAINER TO LATERAL LOAD OF OPEN-END FASTENER

G-1. OUTLINE

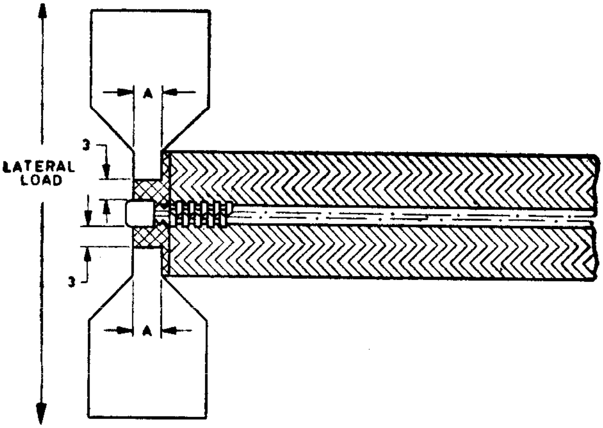
G-1.1 The test specimen is subjected to straight lateral loading under controlled conditions while the fastener chain is in the closed position.

G-2. APPARATUS

G-2.1 A testing machine as described in Appendix B is used. The gripping jaws shall be 12 mm wide. The jaws shall be so constructed and finished as not to damage the tape and not to allow the specimen under test to slip (*see* Fig. 8).

G-3. PROCEDURE

G-3.1 The test specimen is secured in place with the gripping devices set approximately 3 mm from the side edges of the retainer and with one edge of each jaw aligned with the ends of the tapes (*see* Fig. 8). The machine is set in operation until the specified loading is reached, unless the specimen fails earlier.



A = 6 mm for Medium Regular and 12 mm for other sizes.

All dimensions in millimetres.

FIG. 8 LATERAL LOAD TEST FOR RETAINER OPEN-END FASTENER

APPENDIX H

(*Clause* 6.1.7)

METHOD OF TESTING RESISTANCE TO DEFORMATION OF MOUTH OF SLIDER

H-1. APPARATUS

H-1.1 The testing machine as described in **B-2.1** shall be used. A schematic arrangement is given in Fig. 9.

H-2. PROCEDURE

H-2.1 One end of the fixture as shown in Fig. 9 shall be passed through the mouth of the slider and the other end of the fixture shall be clamped in the machine. The puller shall be clamped in the other jaw of the machine. The testing machine shall be set in operation until the loading as specified in **6.1.7** is reached.

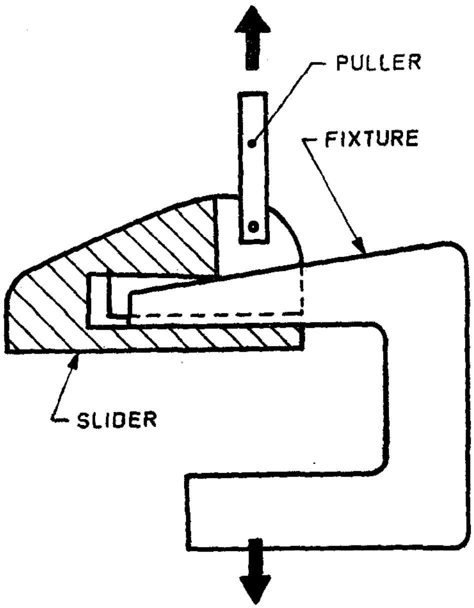


FIG. 9 FIXING ARRANGEMENT OF SLIDER FOR TESTING RESISTANCE TO DEFORMATION OF MOUTH OF SLIDER

APPENDIX J

(*Clause* 8.1)

SAMPLING SCHEME AND CRITERIA FOR CONFORMITY FOR METALLIC SLIDE FASTENERS

J-1. SCALE OF SAMPLING

J-1.1 Lot — All the slide fasteners of the same designation and manufactured from the same raw materials, under essentially similar conditions of manufacture, shall constitute a lot.

J-1.2 The conformity of a lot to the requirements of this standard shall be determined on the basis of tests carried out on the samples selected from the lot.

J-1.3 The number of silde fasteners to be selected from a lot for testing shall depend upon the size of the lot (*see* Table 2), and shall be selected at random from the lot.

J-1.4 The number of fasteners in the first sample (*see* col 2 and 3 of Table 2) shall be first selected and subjected to all the performance tests. If in the first sample the number of defective fasteners, that is, those failing in one or more performance tests, is less than or equal to the corresponding acceptance number *a* (*see* col 5 of Table 2), the lot shall be considered as conforming to the requirements of the standard. If the number of defective fasteners in the first sample is greater than or equal to the corresponding rejection number *r* (col 6 of Table 2), the lot shall be considered as not conforming to the requirements of the standard. If the number of defective fasteners in the first sample lies between the corresponding *a* and *r*, a second sample (col 2 and 3 of Table 2) shall be taken at random from the lot and subjected to performance tests. If in the combined sample (col 4 of Table 2) the number of defective fasteners is less than or equal to the corresponding acceptance number *a* (col 5 of Table 2), the lot shall be considered as not conforming to the requirements of the standard.

TABLE 2 SAMPLE SIZE AND CRITERIA FOR CONFORMITY

LOT SIZE (1)	SAMPLE (2)	SAMPLE SIZE (3)	CUMULATIVE SAMPLE SIZE (4)	ACCEPTANCE NUMBER *a* (5)	REJECTION NUMBER, *r* (6)
Up to 300	First	5	5	0	2
	Second	5	10	1	2
301 to 500	First	8	8	0	2
	Second	8	16	1	2
501 to 1 000	First	13	13	0	2
	Second	13	26	1	2
1 000 to 3 000	First	20	20	0	2
	Second	20	40	1	2
3 001 and above	First	32	32	0	3
	Second	32	64	3	4